

Resiliency Evaluation, Assessment and Contingency Tools, Phase I

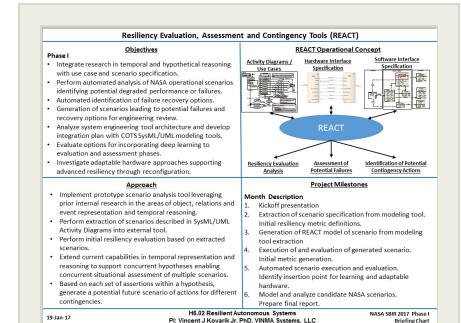
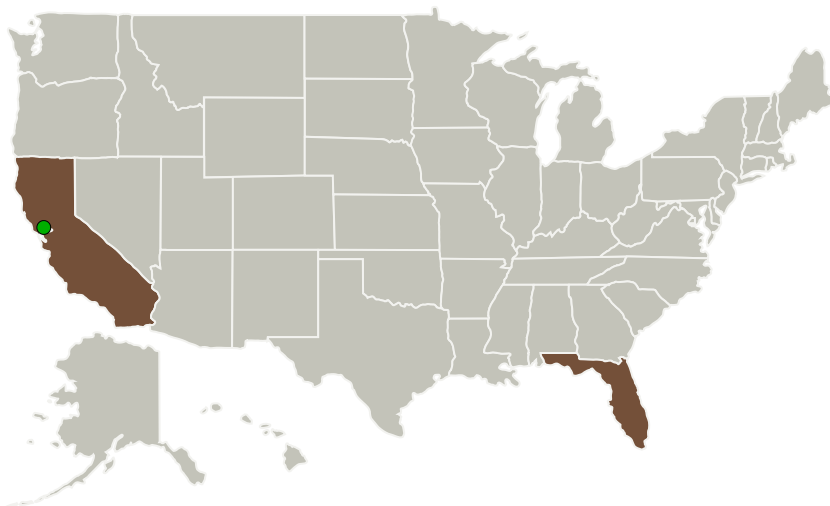
Completed Technology Project (2017 - 2017)



Project Introduction

Resiliency Evaluation, Assessment and Contingency Tools (REACT) Achieving resiliency in any system requires capabilities that are beyond the boundaries of currently available engineering tools and processes. Comprehensive analysis using Use Cases, Activity and Sequence diagrams provide significant benefits over text-based requirements and specifications. However, although these specifications include fault identification and recovery identified as part of the review process, they not consider potential systemic problems that may arise post-deployment in response to unforeseen external influences, unanticipated faults or as a result of cumulative operational anomalies. The REACT project proposed in this Phase I effort will develop a suite of software that will: Integrate research in temporal and hypothetical reasoning with use case and scenario specification. Perform extraction of scenarios described in SysML/UML Activity Diagrams into external tool. Perform initial resiliency evaluation based on extracted scenarios. Perform automated analysis of NASA operational scenarios identifying potential degraded performance or failures. Automated identification of failure recovery options. Generate scenarios leading to potential failures and recovery options for engineering review. Analyze system engineering tool architecture and develop integration plan with COTS SysML/UML modeling tools. Evaluate options for incorporating deep learning to evaluation and assessment phases. Investigate adaptable hardware approaches supporting advanced resiliency through reconfiguration.

Primary U.S. Work Locations and Key Partners



Resiliency Evaluation, Assessment and Contingency Tools, Phase I Briefing Chart Image

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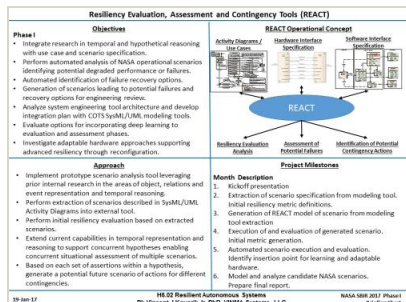


Organizations Performing Work	Role	Type	Location
VINMA Systems, LLC	Lead Organization	Industry	
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California	Florida
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Images



Briefing Chart Image

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Briefing Chart Image

(<https://techport.nasa.gov/image/127360>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

VINMA Systems, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

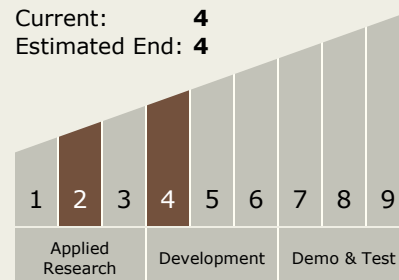
Carlos Torre

Principal Investigator:

Vincent Kovarik

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4





Technology Areas

Primary:

- TX10 Autonomous Systems
 - └ TX10.2 Reasoning and Acting
 - └ TX10.2.6 Fault Response

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System